Data Sheet

RISH CON-Hz

Frequency transducer

Measure   Control   Record   Analyze

Application

The RISH CON - Hz transducer is used for frequency measurement. The output signal is proportional to measured frequency and is either load independent DC Current or load independent DC Voltage.

Salient Features

- Fully onsite programmable input range
- Available in Single or Dual output type
- Onsite selectable output type.(DC current / DC voltage)
- Accuracy class 0.2 (IEC / EN 60688)
- Seven Segment LCD Display
- RS 485(Modbus) Communication
- Wide Auxiliary power supply. Accept any input
  60V - 300V AC/DC or 24V - 60V AC/DC
- Output Response Time < 400ms
- Fast and easy installation on DIN RAIL or onto a wall or in a panel using optional screw hole bracket
- Connection Terminal : Conventional Screw type

Product Features

Measuring Input

Sine wave or distorted wave form of nominal input voltage with fundamental wave.

Analog Output (Single or dual)

Isolated analog output which can be set onsite to either voltage or current output.

Accuracy

Output signal accuracy Class 0.2 as per International Standard IEC / EN 60688.

Programmable Input/Output

The Transducer can be programmed onsite using front key & display or through programming port (COM) or through RS 485.

LED Indication

LED indication for power on and output type.
(Current output : Red LED, Voltage output : Green LED)

Display Module(Optional)

Optional 7 segment LCD display with backlit & keypad. For displaying measured parameters & onsite configuration of Input/output

RS 485 Communication(Optional)

Optional RS485 communication is available. For reading measured parameters & onsite configuration of input/output.

Fig. 1 RISH CON - Hz

Symbols and their meaning

X	Input Frequency
X0	Start value of input
X1	Elbow value of input
X2	End value of input
Y	Output DC Voltage / DC Current
Y0	Start value of output DC Voltage / DC Current
Y1	Elbow value of output DC Voltage / DC Current
Y2	End value of output DC Voltage / DC Current
R_N	Rated value of output burden
U_N	Nominal input voltage

Measure   Control   Record   Analyze

Technical Specifications

Measuring Input X

Frequency Transducer (RISH CON - Hz)

Measuring Ranges	45Hz to 55Hz, 48Hz to 52Hz, 55Hz to 65Hz, 45Hz to 65Hz (min span 4Hz)
Nominal input Voltage(UN)	57V ≤ UN ≤ 500 V
Nominal input Voltage burden	< 0.6 VA max
Overload Capacity	1.2 *UN continuously,
	2 *UN for 1 second, repeated 10 times at 10 minute intervals
	(maximum 300V with power supply powered from measuring input).

Measuring Output Y(Single or Optional Dual)

Output type	Load independent DC Voltage , DC Current
	onsite selectable through DIP switches
Load independent DC output	0…20mA / 4…20mA OR 0…10V
Output burden with DC current output Signal	$0 ≤ R ≤ 15V/Y2$
Output burden with DC voltage output Signal	$Y2/(2\ mA) ≤ R ≤ ∞$
Current limit under overload R=0	$≤ 1.25 * Y2$ with current output
	≤ 100 mA with Voltage output
Voltage limit under R=∞	$< 1.25 * Y2$ with voltage output
	≤ 30 V with current output
Residual Ripple in Output signal	≤ 1% pk-pk
Response Time	< 400 ms

Auxiliary Power Supply

AC/DC Auxiliary Supply	60V… 300 VAC-DC ± 5% or 24V... 60VAC-DC ± 10%
AC Auxiliary supply frequency range	40 to 65 Hz
Auxiliary supply consumption	

60V...300 VAC-DC	≤ 8VA for Single output
	≤ 10VA for Dual output
24V...60 VAC-DC	≤ 5 VA for Single output
	≤ 6 VA for Dual output

Measure   Control   Record   Analyze

Accuracy (Acc. to IEC / EN 60688)

Reference Value   Output end Value Y2 (Voltage or Current)

Basic Accuracy   0.2*C

Factor C (The highest value applies if calculated C is less than 1,then C=1 applies)

Linear characteristics:	Bent characteristics:	For X1 $\leq$ X $\leq$ X2:
$C = \dfrac{1-\frac{Y0}{Y2}}{1-\frac{X0}{X2}}$ or C=1	For X0 $\leq$ X $\leq$ X1: $C = \dfrac{Y1 - Y0}{X1 - X0} \cdot \dfrac{X2}{Y2}$ or C=1	$C = \dfrac{1-\frac{Y1}{Y2}}{1-\frac{X1}{X2}}$ or C=1

Reference conditions for Accuracy

Ambient temperature	23°C +/- 1°C
Pre-conditioning	30 min acc. to IEC / EN 60688
Input Variable	Rated Voltage / Rated Current
Input waveform	Sinusoidal, Form Factor 1.1107
Input signal frequency	50 or 60Hz
Auxiliary supply voltage	At nominal range
Output Load	Rn = 7.5 V / Y2 ± 1% With DC current output signal
	Rn = Y2 / 1 mA ± 1% With DC voltage output signal
Miscellaneous	Acc. to IEC / EN 60688

Additional error

Temperature influence   ±0.2% /10°C

Influence of Variations

As per IEC / EN 60688 standard Output Stability   < 30 min

Output Characteristics

Example of setting with Linear Characteristics :   *Example of setting with bent Characteristics:*

X0 = Start value of input   Y0 = Start value of output

X1 = Elbow value of input   Y1 = Elbow value of output

X2 = End value of input   Y2 = End value of output

Note: End value(Y2) of output cannot be changed onsite.

Measure   Control   Record   Analyze

Safety

Protection Class   II (Protection Isolated, EN 61010)

Protection   IP 40, housing according to EN 60 529
                                    IP 20, terminal according to EN 60 529

Pollution degree   2

Installation Category   III

Insulation Voltage   1min. (EN 61010-1)
                                    7700V DC, Input versus outer surface
                                    5200V DC, Input versus all other circuits
                                    5200V DC, Auxiliary supply versus outer surface and output
                                    690V DC, Output versus output versus each other versus outer surface.

Installation Data

Mechanical Housing   Lexan 940 (polycarbonate)
                                    Flammability Class V-0 acc. to UL 94, self extinguishing,
                                    non dripping, free of halogen

Mounting position   Rail mounting / wall mounting

Weight   Approx. 0.4kg

Connection Terminal

Connection Element   Conventional Screw type terminal with indirect wire pressure

Permissible cross section
of the connection lead   ≤ 4.0 mm² single wire or 2 x 2.5 mm² fine wire

Environmental

Nominal range of use   0 °C...23 °C...45 °C (Usage Group II)

Storage temperature   -40 °C to 70 °C

Relative humidity of annual mean   ≤ 75%

Altitude   2000m max

Ambient tests

EN 60 068-2-6   Vibration

Acceleration   ± 2 g

Frequency range   10....150...10Hz, rate of frequency sweep: 1 octave/minute

Number of cycles   10, in each of the three axes

EN 60 068-2-7   Shock

Acceleration   3*50g
                                    3 shocks in each direction

IEC 61000-4-2/-3/-4/-5/-6
EN 55 011   Electromagnetic compatibility

Measure   Control   Record   Analyze

ON LED	Aux.supply healthy condition	Green LED continuous ON
O/P1 LED	Output1 voltage selection	Green LED continuous ON
	Output1 Current selection	Red LED continuous ON
O/P2 LED	Output2 voltage selection	Green LED continuous ON
	Output2 Current selection	Red LED continuous ON

Electrical Connections

Connection	Terminal details	
Measuring input	~ ~	5 6
Auxilliary Power supply	~ , + ~ , -	7 8
Measuring output - 1	+ -	1 2
Measuring output - 2	+ -	3 4

Fig 2.

Dimensions
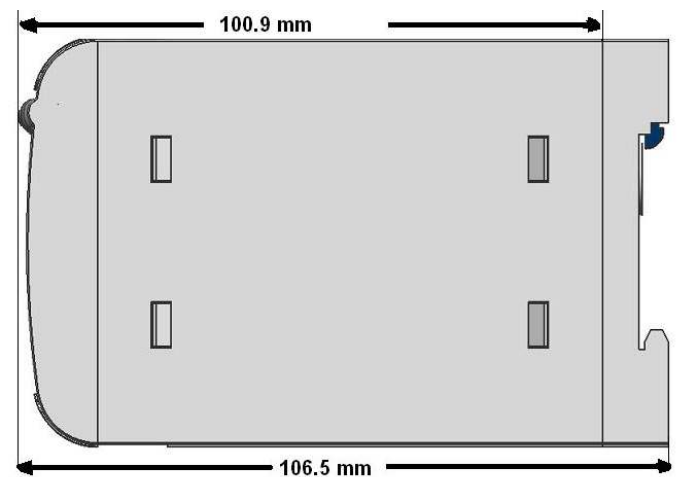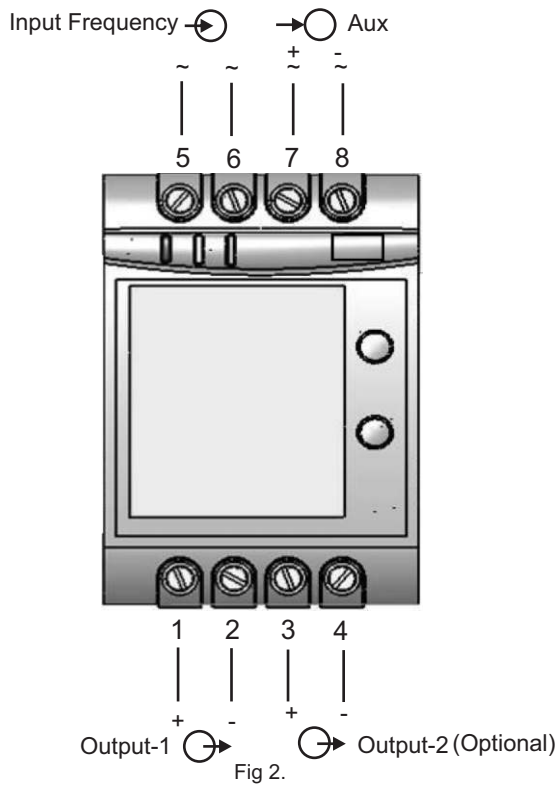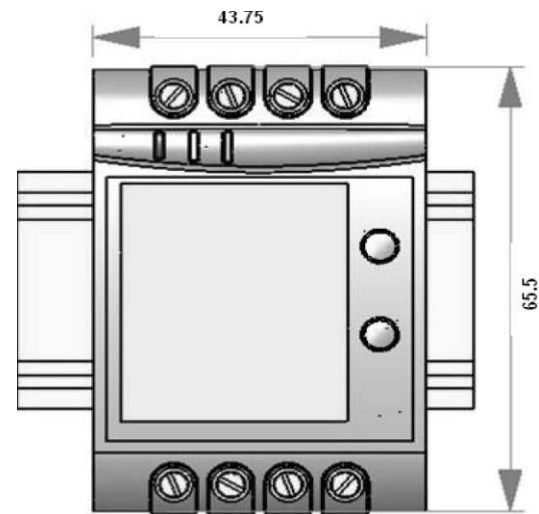
Fig 3.

Measure   Control   Record   Analyze

Programming (Figs. 4 and 5)

Programming of transducer can be done in three ways

- Programming Via Front LCD & two keys
- Programming Via optional RS485(MODBUS) communication port (Device address, Password, communication parameter, Output Type & simulation mode can be programmed)
- Programming Via Programming port available at front of RISH CON Transducers using (optional) PRKAB601 Adapter.
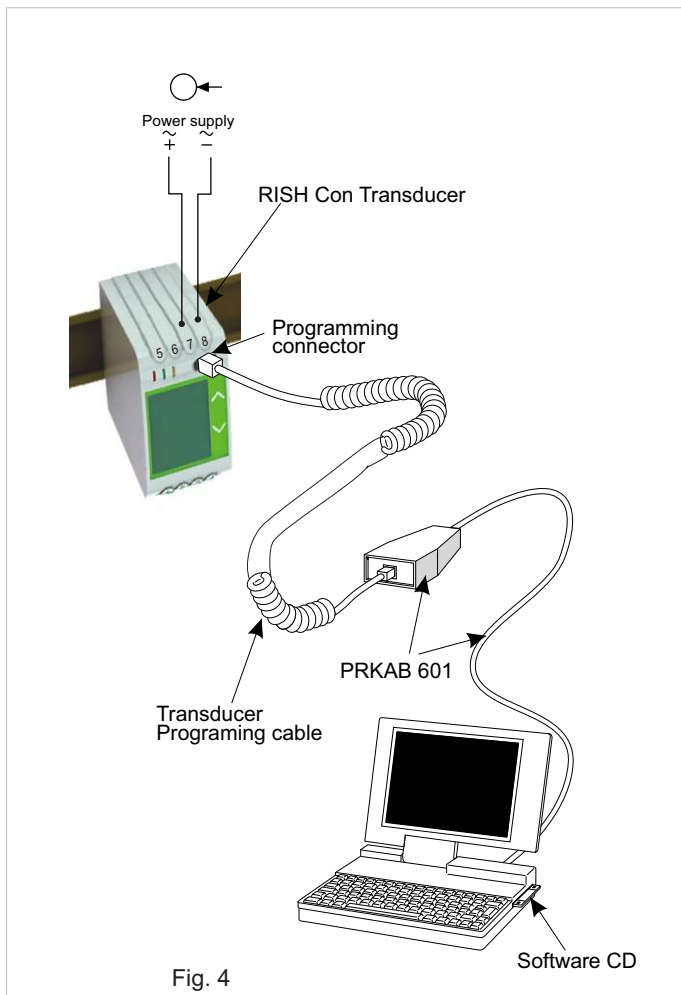
Programming Via Programming port (COM)

A PC with RS 232 C interface along with the programming cable PRKAB601 and the configuration software are required to program the transducer.

The connections between

"PC ⟷ PRKAB 601 ⟷ Rish CON Transducer..

The powersupply mustbe applied to Transducer before it can be programmed.

The Configuration software is supplied on a CD.

The programming cable PRKAB601 adjusts the signal level and provides the electrical insulation between the PC and RISH CON Transducers.

Configuring Rish Con Transducer :

To configure RISH CON Transducer Input / output one of the three programming methods can be adapted along with mechanical switch setting (DIP switch setting on PCB for output).

DIP Switch Setting for OUTPUT :

Type of output (current or voltage signal) has to be set by DIP switch (see Fig.5).

For programming of DIP switch the user needs to open the transducer housing & set the DIP switch located on PCB to the desired output type Voltage or Current.

Output range changing is not possible with DIP switch setting.

Refer below Fig. 5 for DIP switch setting.

The four pole DIP switch is located on the PCB in the RISH CON Transducer

Fig. 4

DIP Switch Setting	Type of Output Signal
ON [1234]	load-independent current
ON [1234]	load-independent voltage

Fig. 5

Ordering Information

Product Code	CF41-	X	XX	X	X	X	X	X	00000
Input Range	45-55Hz	6							
	55-65Hz	B							
	45-65Hz	7							
	48-52Hz	A							
Input Voltage	100-500V		8F						
Power Supply	60-300 VAC/DC			H					
	24-60 VAC/DC			F					
Output	1 O/P				1				
	2 O/P				2				
Display Module	With Display					D			
	Without Display					Z			
RS485 Module	With RS-485						R		
	Without RS-485						Z		
Programming Cable	With - PRKAB 601							C	
	Without - PRKAB 601							Z	

Ordering Example – CF41-B8FH1DZZ00000 – 55-65Hz, 100-500V, Aux 60-300 VAC/DC, With display, without RS485, Without - PRKAB 601

Analog DC output options as below, to be specified while ordering only

Current Output	Voltage Output	DIP Option
Standard Ranges		
0/4.....20 mA	0.....10 V	Yes
Optional factory set ranges		
0.....10 mA	0.....5 V	No
0.....5 mA	0.....2.5 V	No
0.....2.5 mA	0.....1 V	No
0.....1 mA		

Note: End value of output can not be changed onsite.

Measure   Control   Record   Analyze

RISHABH